What is claimed is:

1. A light beam detection system comprising:
   - an area sized to receive the light beam;
   - a beam separator disposed in the area to separate a small portion of the light beam from a remainder of the light beam to provide a separated light beam and a remainder light beam and to transmit the separated light beam to a spectroscopy device;
   - an imaging device disposed in the area to operably receive the remainder light beam to provide an image therefrom; and,
   - a spectroscopy device optically connected to the beam separator to receive the separated light beam to provide a spectrum therefrom.

2. The light beam detection system of claim 1 wherein the spectroscopy device is located outside of the light beam and the beam separator comprises a light redirection device sized and located to intercept a small area of the light beam and change the direction of such small area toward the spectroscopy device, and wherein the light redirection device imparts a small residual image in the remainder light beam corresponding to the location of the light redirection device in the light beam.

3. The light beam detection system of claim 2 wherein the light redirection device and the small residual image are located substantially in the center of the light beam.

4. The light beam detection system of claim 2 wherein the light redirection device separates substantially all light incident on the light redirection device from the remainder light beam.

5. The light beam detection system of claim 4 wherein the light redirection device is a measurement port of the spectroscopy device, a mirror, a prism, a light guide, a beam splitter or a lens.

6. The light beam detection system of claim 1 wherein the beam separator is a beam splitter that intercepts a large portion of the light beam such that the beam splitter does not leave a significant residual image in the remainder light beam, and wherein the beam splitter transmits substantially more than 50% of the electromagnetic radiation in the light beam to the imaging device and reflects substantially less than 50% of the electromagnetic radiation in the light beam to the spectroscopy device.

7. The light beam detection system of claim 6 wherein the beam splitter transmits at least about 80% of the light beam and reflects at most about 20% of the light beam.

8. The light beam detection system of claim 6 wherein the beam splitter transmits at least about 90% of the light beam and reflects at most about 10% of the light beam.

9. The light beam detection system of claim 1 wherein the imaging device is a pixelated detector.

10. The light beam detection system of claim 9 wherein the pixelated detector comprises at least one of a CCD, an intensified CCD, a CID, a CMOS, a photodiode array, and a photomultiplier array.

11. The light beam detection system of claim 1 wherein the imaging device is a non-pixelated detector.

12. The light beam detection system of claim 1 wherein the spectroscopy device comprises at least one of a spectrometer, a scanning monochromater coupled with a single channel detector, an imaging spectrograph coupled with an array detector, and an interferometer based Fourier transform (FT) type spectrometer.

13. The light beam detection system of claim 1 wherein the beam separator is located in substantially a same image plane as the imaging device.

14. The light beam detection system of claim 1 wherein the beam separator is located substantially in front of and does not touch the imaging device.

15. The light beam detection system of claim 14 wherein the system further comprises a first focusing element in front of the beam separator and a second focusing element between the beam separator and the imaging device, the first focusing element and the second focusing element located to provide a first conjugate image plane substantially at the beam separator and a second conjugate image plane substantially at the imaging device.

16. The light beam detection system of claim 1 wherein the beam separator abuts the imaging device.

17. The light beam detection system of claim 1 wherein the beam separator is behind the imaging device.

18. The light beam detection system of claim 1 wherein the system further comprises an image display device operably connected to the imaging device to display an image from the imaging device.

19. The light beam detection system of claim 1 wherein the system further comprises a spectrum display device operably connected to the spectroscopy device to display a spectrum from the spectroscopy device.

20. The light beam detection system of claim 18 wherein the system further comprises a spectrum display device operably connected to the spectroscopy device to display a spectrum from the spectroscopy device.

21. The light beam detection system of claim 20 wherein the image display device and the spectrum display device is a single display device operable to contemporaneously display both the image from the imaging device and the spectrum from the spectroscopy device.

22. The light beam detection system of claim 20 wherein the system further comprises an image separator comprising a plurality of light selection elements that separates the image into a plurality of selected wavelength region images wherein each selected wavelength region image corresponds to a different wavelength region of the range of wavelengths in the light beam.

23. The light beam detection system of claim 22 wherein the image separator comprises a plurality of imaging beam splitters each of which selects for different selected wavelength regions to provide the selected wavelength region images and directs the selected wavelength region images to different imaging devices.

24. The light beam detection system of claim 23 wherein the different imaging devices are different regions of a single imaging detector.

25. The light beam detection system of claim 23 wherein the imaging beam splitters are disposed linearly along the light beam.

26. The light beam detection system of claim 23 wherein there are at least three imaging beam splitters disposed to reflect the selected wavelength region images in at least three different radial directions and the different imaging devices are disposed radially about the light beam to receive the selected different wavelength images.

27. The light beam detection system of claim 23 wherein the imaging beam splitters are disposed alternatingly such that a first sub-set of the imaging beam splitters direct a first set of selected wavelength region images in a first

direction and a second sub-set of the imaging beam splitters direct a second set of selected wavelength region images in a second direction that is substantially 90° or 180° away from the first direction.

28. The light beam detection system of claim 23 wherein the imaging beam splitters select for all but one desired, non-selected different wavelength region to provide a non-selected wavelength region image, the image separator further comprising an imaging device located in the light beam and behind the imaging beam splitters to directly receive the non-selected wavelength region image.

29. The light beam detection system of claim 23 wherein the different wavelength regions comprise UV to blue light, visible light, near-infrared light and infrared light.

30. The light beam detection system of claim 29 wherein the display device is operably connected to the image separator to contemporaneously display at least two images selected from the UV to blue light, visible light, near-infrared light and infrared light, and wherein the display device is further able to contemporaneously display the spectrum from the spectroscopy device.

31. The light beam detection system of any one of claims 1, 2, 6, 20, 22, or 30 wherein the system further comprises a controller operably connected to the imaging device and the spectroscopy device and containing computer-implemented programming that controls the imaging device and the spectroscopy device.

32. An endoscope comprising the light beam detection system of any one of claims 1, 2, 6, 20, 22, or 30.

33. A microscope comprising the light beam detection system of any one of claims 1, 2, 6, 20, 22, or 30.

34. A telescope comprising the light beam detection system of any one of claims 1, 2, 6, 20, 22, or 30.

35. A camera comprising the light beam detection system of any one of claims 1, 2, 6, 20, 22, or 30.

36. The camera of claim 35 wherein the system is part of a digital imaging system.

37. The camera of claim 35 wherein the system is part of a film imaging system.

38. An image and spectral detection system comprising an image detector disposed substantially coplanar with a light collection element for a spectroscopy device, the image detector and the light collection element together sized to receive a light beam.

39. The image and spectral detection system of claim 38 wherein the image detector and the light collection element are side-by-side.

40. The image and spectral detection system of claim 39 wherein the light collection element is encompassed by the image detector.

41. The image and spectral detection system of claim 39 wherein the light collection element is located substantially in the center of the image detector.

42. The image and spectral detection system of claim 38 wherein the image detector has an area sized to receive the light beam and the light collection element is less than about 3% of the area of the image detector.

43. The image and spectral detection system of claim 38 wherein the light collection element is a measurement port for a spectroscopy device located immediately behind the image detector.

44. The image and spectral detection system of claim 38 wherein the light collection element is an input end of a light guide that transmits collected light to a remotely located spectroscopy device.

45. The image and spectral detection system of claim 38 wherein the light collection element is a focusing element that transmits collected light to a remotely located spectroscopy device.

46. The image and spectral detection system of claim 38 wherein the light collection element is a mirror that transmits collected light to a remotely located spectroscopy device.

47. The image and spectral detection system of claim 38 wherein the imaging device is able to determine spectra and wherein the light collection element comprises a portion of the imaging device dedicated to spectral determination.

48. An imaging system able to provide a plurality of images corresponding to different wavelength regions of an initial image, the imaging system comprising an image separator comprising a light beam path and a plurality of imaging beam splitters disposed in the light beam path, each of the imaging beam splitters selecting for different selected wavelength regions of the initial image to provide corresponding different selected wavelength region images and directing the different selected wavelength region images to different imaging devices.

49. The imaging system of claim 48 wherein the system further comprises at least one display device operably connected to display at least one of the different selected wavelength region images from the different imaging devices.

50. The imaging system of claim 49 wherein the different imaging devices comprise different regions of a single imaging detector.

51. The imaging system of claim 49 wherein the different imaging devices comprise physically separate imaging detectors.

52. The imaging system of claim 49 wherein the imaging beam splitters are disposed linearly along the light beam.

53. The imaging system of claim 49 wherein the system comprises at least three imaging beam splitters that disposed to reflect the different selected wavelength region images in at least three different radial directions and the different imaging devices are disposed radially about the light beam to receive the different selected wavelength region images.

54. The imaging system of claim 49 wherein the imaging beam splitters are disposed alternatingly such that a first sub-set of the imaging beam splitters direct a first set of different selected wavelength region images in a first direction and a second sub-set of the imaging beam splitters direct a second set of different selected wavelength region images in a second direction that is substantially 180° away from the first direction.

55. The imaging system of claim 49 wherein the different imaging beam splitters select for all but one desired, non-selected different selected wavelength region image to provide a non-selected wavelength region image, and wherein the imaging system further comprises an imaging device located in the light beam and behind the imaging beam splitters to directly receive the non-selected wavelength region image.

56. The imaging system of claim 49 wherein the display device is operably connected to the image separator to contemporaneously display at least two

images selected from UV to blue light, visible light, near-infrared light and infrared light and wherein the display device is further able to contemporaneously display a spectrum from a spectroscopy device that is operably connected to obtain the spectrum from light in the light beam path.

57. A method of detecting a light beam comprising:
- separating via a beam separator a small portion of the light beam from a remainder of the light beam to provide a separated light beam and a remainder light beam;
- transmitting the separated light beam to a spectroscopy device optically connected to the beam separator; and,
- transmitting the remainder light beam to an imaging device optically connected to receive the remainder light beam and to provide an image therefrom.

58. The method of claim 57 wherein the method further comprises displaying on a display device a spectrum from the spectroscopy device and the image from the imaging device.

59. The method of claim 58 wherein the spectroscopy device is located outside of the light beam and the beam separator comprises a light redirection device sized and located to intercept substantially all light in a small area of the light beam and change the direction of such light toward the spectroscopy device, and wherein the method further comprises imparting via the light redirection device a small residual image in the remainder light beam corresponding to the location of the light redirection device in the light beam.

60. The method of claim 58 wherein the beam separator is a beam splitter that intercepts a large portion of the light beam such that the beam splitter does not leave a significant residual image in the remainder light beam, and wherein the method further comprises transmitting through the beam splitter substantially more than 50% of the electromagnetic radiation in the light beam

to the imaging device and reflecting via the beam splitter substantially less than 50% of the electromagnetic radiation in the light beam to the spectroscopy device.

61. The method of claim 60 wherein the method further comprises transmitting through the beam splitter at least about 80% of the electromagnetic radiation in the light beam and reflecting via the beam splitter at most about 20% of the electromagnetic radiation in the light beam.

62. The method of claim 58 wherein the beam separator is located in substantially a same image plane as the imaging device.

63. The method of claim 58 wherein the beam separator is located substantially in front of and does not touch the imaging device and wherein the method further comprises passing the light beam through a first focusing element in front of the beam separator and a second focusing element between the beam separator and the imaging device such that the first focusing element provides a first conjugate image plane substantially at the beam separator and the second focusing element located to provides a second conjugate image plane substantially at the imaging device.

64. The method of claim 58 wherein the beam separator abuts the imaging device.

65. The method of claim 58 wherein the method further comprises contemporaneously displaying both the image from the imaging device and the spectrum from the spectroscopy device on a single display device.

66. The method of claim 58 wherein the method further comprises passing the light beam through an image separator and separating the image into a plurality of wavelength region images corresponding to an equivalent plurality

of different wavelength regions of the light beam, and then displaying the wavelength region images on the display device.

67. The method of claim 66 wherein the separating comprises passing the light beam through a plurality of imaging beam splitters each of which selects for different selected wavelength regions and directs the selected different wavelength regions to different imaging devices.

68. The method of claim 67 wherein the separating comprises passing the light beam through a plurality of different imaging beam splitters disposed linearly along the light beam and directing the selected different wavelength regions to different, linearly disposed imaging devices.

69. The method of claim 67 wherein the separating comprises passing the light beam through a plurality of different imaging beam splitters disposed such that the selected different wavelength regions are reflected in different radial directions.

70. The method of claim 67 wherein the separating comprises passing the light beam through a plurality of imaging beam splitters disposed alternatingly such that a first sub-set of the imaging beam splitters direct a first set of selected different wavelength regions in a first direction and a second sub-set of the imaging beam splitters direct a second set of selected different wavelength regions in a second direction that is substantially 180° away from the first direction.

71. The method of claim 67 wherein the method further comprises, via the imaging beam splitters, selecting for all but one desired, non-selected different wavelength region and then transmitting the one desired, non-selected different wavelength region to an imaging device located in the light beam and behind the imaging beam splitters.

72. The method of any one of claims 58, 59, 60, or 66 wherein the method is implemented via a controller operably connected to the imaging device and the spectroscopy device and containing computer-implemented programming that controls the imaging device and the spectroscopy device.

73. The method of any one of claims 58, 59, 60, or 66 wherein the method is implemented via an endoscope.

74. A method of providing a plurality of images derived from different wavelength regions of an initial image, the method comprising:

- passing a light beam carrying the initial image along a light beam path in an image separator comprising a plurality of imaging beam splitters disposed in the light beam path;
- selecting different selected wavelength regions of the initial image via the imaging beam splitters to provide selected wavelength region images; and,
- directing the selected wavelength region images to different imaging devices.

75. The method of claim 74 wherein the method further comprises selectively displaying at least one of the selected wavelength region images on a display device.

76. The method of claim 75 wherein the method further comprises selectively displaying all of the selected wavelength region images.

77. The method of claim 75 wherein the different imaging beam splitters select for all but one desired, non-selected different wavelength region to provide a non-selected wavelength region image, and wherein the imaging system further comprising an imaging device located in the light beam and behind the imaging beam splitters to directly receive the non-selected wavelength region image.

78. A system means for detecting a light beam comprising:

- an area means for receiving the light beam;
- a means for separating the light beam disposed in the area means to separate a small portion of the light beam from a remainder of the light beam to provide a separated light beam and a remainder light beam and means to transmit the separated light beam to a means for spectroscopy;
- a means for imaging disposed in the area means to operably receive the remainder light beam to provide an image therefrom; and,
- a means for spectroscopy optically connected to the means for separating the light beam to receive the separated light beam to provide a spectrum therefrom.

79. The means for detecting a light beam of claim 78 wherein the means for spectroscopy is located outside of the light beam and the means for separating the light beam comprises a means for light redirection sized and located to intercept a small area of the light beam and change the direction of such small area toward the means for spectroscopy, and wherein the means for light redirection separates substantially all light incident thereon from the remainder light beam and imparts a small residual image in the remainder light beam corresponding to the location of the means for light redirection in the light beam.

80. The means for detecting a light beam of claim 78 wherein the means for separating the light beam is a means for splitting the light beam that transmits at least about 80% of the light beam and reflects at least about 20% of the light beam.

81. The means for detecting a light beam of claim 78 wherein the means for detecting a light beam further comprises a means for displaying operably connected to the means for imaging to display an image from the means for imaging.

82. The means for detecting a light beam of claim 78 wherein the system further comprises a means for displaying operably connected to the means for spectroscopy to display a spectrum from the means for spectroscopy.

83. The means for detecting a light beam of claim 78 wherein the system further comprises a means for image separating comprising a plurality of means for selecting light that separates the image into a plurality of selected wavelength region images wherein each selected wavelength region image corresponds to a different wavelength region of the range of wavelengths in the light beam.

84. The means for detecting a light beam of claim 78 wherein the means for detecting comprises a means for controlling operably connected to the imaging detector and the means for spectroscopy and containing computer-implemented programming that controls the means for imaging and the means for spectroscopy.

85. A system means for imaging able to provide a plurality of images corresponding to different wavelength regions of an initial image, the system means for imaging comprising a means for image separating comprising a light beam path and a plurality of means for splitting the imaging beam disposed in the light beam path, selecting for different selected wavelength regions of the initial image to provide corresponding selected wavelength region images and directing the selected different wavelength images to different means for imaging.

86. A method of detecting a light beam comprising:

- a step of separating via a means for separating a small portion of the light beam from a remainder of the light beam to provide a separated light beam and a remainder light beam;
- a step of transmitting the separated light beam to a means for spectroscopy optically connected to the means for separating the light beam; and,

- a step of transmitting the remainder light beam to a means for imaging optically connected to receive the remainder light beam and to provide an image therefrom.

87. The method of claim 86 wherein the method further comprises a step of displaying on a means for displaying a spectrum from the means for spectroscopy and the image from the means for imaging.

88. The method of claim 87 wherein the means for spectroscopy is located outside of the light beam and the means for separating the light beam comprises a means for light redirection sized and located to intercept a small area of the light beam and change the direction of such small area toward the means for spectroscopy, and wherein the method further comprises imparting via the means for light redirection a small residual image in the remainder light beam corresponding to the location of the means for light redirection in the light beam.

89. The method of claim 88 wherein the method further comprises a step of contemporaneously displaying both the image from the means for imaging and the spectrum from the means for spectroscopy on a single means for displaying.

90. The method of claim 89 wherein the method is implemented via a means for controlling operably connected to the means for imaging and the means for spectroscopy and containing computer-implemented programming that controls the means for imaging and the means for spectroscopy.

91. A method of providing a plurality of images derived from different wavelength regions of an initial image, the method comprising:

- a step of passing a light beam carrying the initial image along a light beam path in a means for image separating comprising a plurality of means for splitting the imaging beam disposed in the light beam path;

- a step of selecting different selected wavelength regions of the initial image via the means for splitting the imaging beam to provide selected wavelength region images; and,
- a step of directing the selected wavelength region images to different means for imaging.